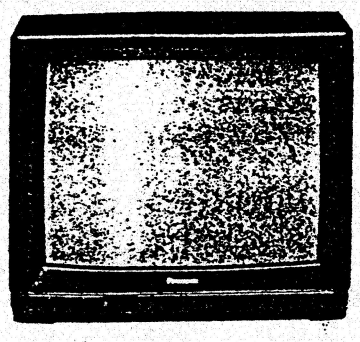
ORDER No. SM 91039

Service Manual



Colour Television

TX-28J1C

ALPHA-2 Chassis

Specifications

Power Source:	230 V AC, 50 Hz
Power Consumption:	103Wh
Aerial Impedance:	75 Ω unbalanced, Coaxial Type
Receiving System:	PAL-B, G, SECAM-B,G,D,K.
Receiving Channels:	VHF E2-E12 VHF R1-R12 UHF E21-E69 CATV S1-S20 HYPER S21-S41
Intermediate Frequency:	Video 38.9 MHz Sound 33.4 MHz Colour 34.47 MHz (PAL) 34.5 MHz (SECAM) 34.65 MHz (SECAM)
Video/Audio Terminals:	
AV1 IN	Video (21pin) 1 Vp-p 75 Ω Audio (21pin) 0.67 Vrms, 10k Ω
AV1 OUT	Video (21pin) 1 Vp-p 75 Ω Audio (21pin) 0.67 Vrms, 1k Ω (100 % modulation)
AV2 IN	Video (21pin) 1 Vp-p 75 Ω Audio (21pin) 0.67 Vrms, 10k Ω
S-Video IN (21 pin)	Y : 1 Vp-p 75 Ω C : 0.3 Vp-p 75 Ω
AV2 OUT	Video (21pin) 1 Vp-p 75 Ω Audio (21pin) 0.67 Vrms, 1k Ω (100 % modulation)
S-Video (4 pin) IN	Y : 1 Vp-p 75 Ω C : 0.3 Vp-p 75 Ω
Audio(RCA x 2)	0.67 Vrms, 10k Ω
AV3 IN	Video (BNC) 1 Vp-p 75 Ω Audio (RCA x 2) 0.67 Vrms, 10k Ω
High Voltage:	29.0 kV at zero beam current
Picture Tube:	28 inches measured diagonally, 110° deflection
Audio Output:	
Internal Speaker	2 x 10W (Music Power) 4 Ω Impedance
External Speaker	2 x 20W (Music Power) 8 Ω Impedance
Speakers:	2 x 10cm round Type 2 x 7.5x4.5cm oval Type
Headphones:	1: 8ΩImpedance
Accessories supplied:	Remote Controller UM4 Battery
Dimensions:	Height: 565mm Width: 680mm Depth: 485mm
Net Weight:	38kg

Specifications are subject to change without notice.
Weight and dimensions shown are approximate.

Technische Daten

Netzpannung:	230 V AC, 50 Hz
Leistungsaufnahme:	103Wh
Antennenimpedanz:	75 Ω asymmetrisch, Koaxial-Typ
Empfangssystem:	PAL - B,G, SECAM-B,G,D,K.
Empfangsbereiche:	VHF E2 - E12 VHF R1-R12 UHF E21-E69 CATV S1-S20 HYPER S21-S41
Zwischenfrequenz:	Bild 38,9 MHz Ton 33,4 MHz Farbe 34,47 MHz (PAL) 34.5 MHz (SECAM) 34.65 MHz (SECAM)
Video/Audio Anschüsse:	
AV1 Eingang	Video (21pin) 1Vs-s 75Ω Audio (21pin) 0.67 Vrms, 10kΩ
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AV2 Eingang	Video (21pin) 1 Vs-s 75Ω Audio (21pin) 0.67 Vrms, 10kΩ
S-Video Eingang (21 pin)	Y : 1 Vp-p 75 Ω C : 0.3 Vp-p 75 Ω
AV2 Ausgang	Video (21pin) 1 Vs-s 75Ω Audio (21pin) 0.67 Vrms 1kΩ (100 % modulation)
AV2 S-Video Eingang (4 pin)	Y : 1 Vs-s 75 Ω C : 0.3 Vs-s 75 Ω
Audio (RCA x 2)	0.67 Vrms, 10kΩ
AV3 Eingang	Video (BNC) 1 Vs-s 75Ω Audio (RCA x 2) 0.67 Vrms, 10kΩ
Hochspannung:	29.0 kV bei Nullstrahlstom
Bildrohre :	70cm Diagonale, 110° Ablenkung
Ton Ausgangsleistung:	
Einbaulautsprecher	2 x 10W (Musikleistung) 4 Ω Impedanz
Zusatz-Lautsprecherbzen	2 x 20W (Musikleistung) 8 Ω Impedanz
Lautsprecher:	2 x 10cm rund type 2 x 7.5x4.5cm oval type
Kopfhörer:	1: 8ΩImpedanz
Mitgeliefertes Zubehör:	Fernbedienung UM4 Batterien
Abmessungen:	Höhe: 565mm Breite: 680mm Tiefe: 485mm
Gewicht:	38kg

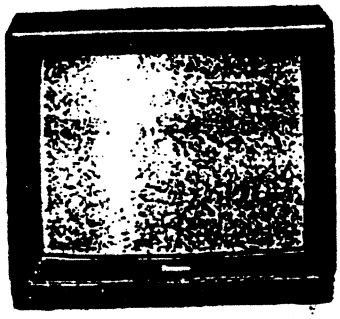
Änderungen der technischen Daten vorbehalten.
Gewichte und Abmessungen sind Näherungsangaben.

Panasonic

ORDER No. SM 91039

Service Manual

Colour Television



TX-28J1C

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S-Video IN (21 pin)	Y : 1 Vp-p 75 Ω C : 0.3 Vp-p 75 Ω
AV2 OUT	Video (21pin) 1 Vp-p 75 Ω Audio (21pin) 0.67 Vrms, 1kΩ (100 % modulation)
S-Video (4 pin) IN	Y : 1 Vp-p 75 Ω C : 0.3 Vp-p 75 Ω
Audio(RCA x 2)	0.67 Vrms, 10k Ω
AV3 IN	Video (BNC) 1 Vp-p 75 Ω Audio (RCA x 2) 0.67 Vrms, 10k Ω
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Audio Output:	
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AV1 Ausgang	Video (21pin) 1 Vs-s 75Ω Audio (21pin) 0.67 Vrms 1kΩ (100 % modulation)
AV2 Eingang	Video (21pin) 1 Vs-s 75Ω Audio (21pin) 0.67 Vrms, 10kΩ
S-Video Eingang (21 pin)	Y : 1 Vp-p 75Ω C : 0.3 Vp-p 75Ω
AV2 Ausgang	Video (21pin) 1 Vs-s 75Ω Audio (21pin) 0.67 Vrms 1kΩ (100 % modulation)
AV2 S-Video Eingang (4 pin)	Y : 1 Vs-s 75Ω C : 0.3 Vs-s 75Ω
Audio (RCA x 2)	0.67 Vrms, 10kΩ
AV3 Eingang	Video (BNC) 1 Vs-s 75Ω Audio (RCA x 2) 0.67 Vrms, 10kΩ
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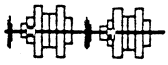
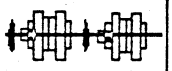
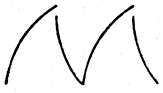
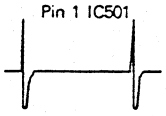
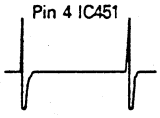
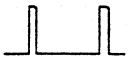
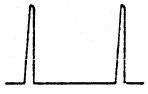
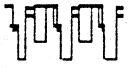
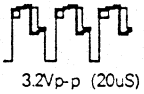
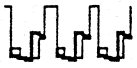
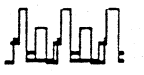
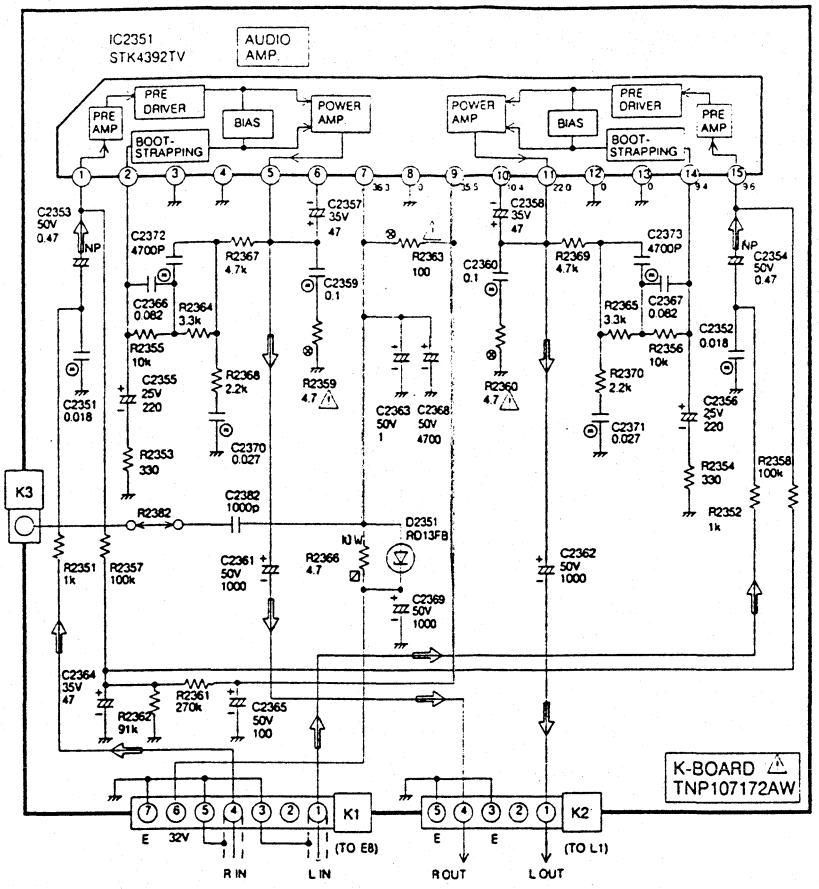
Kopfhörer:	1: 8ΩImpedanz
Mitgeliefertes Zubehör:	Fernbedienung UM4 Batterien
Abmessungen:	Höhe: 565mm Breite: 680mm Tiefe: 485mm
Gewicht:	38kg

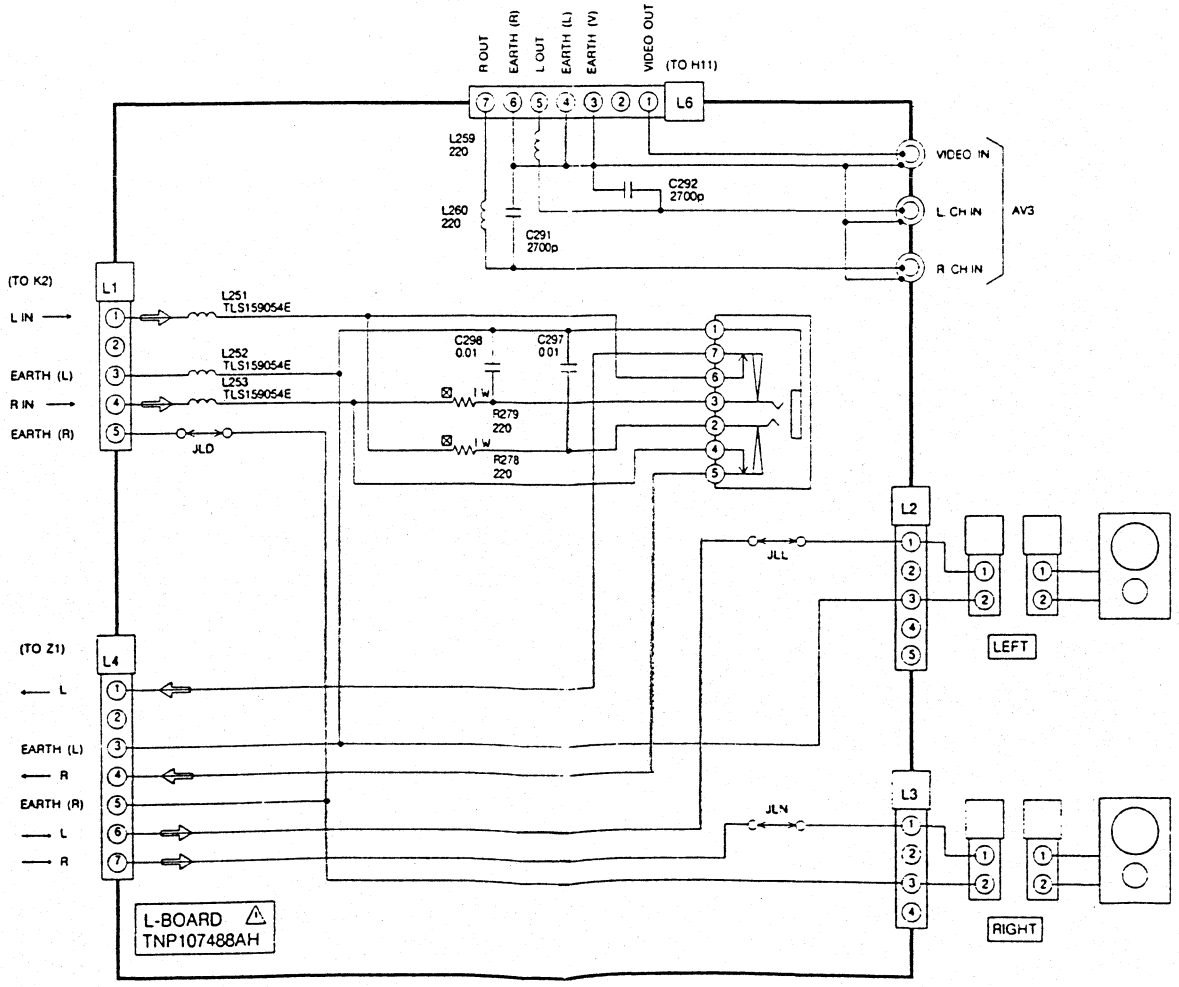
Änderungen der technischen Daten vorbehalten.
Gewichte und Abmessungen sind Näherungsangaben

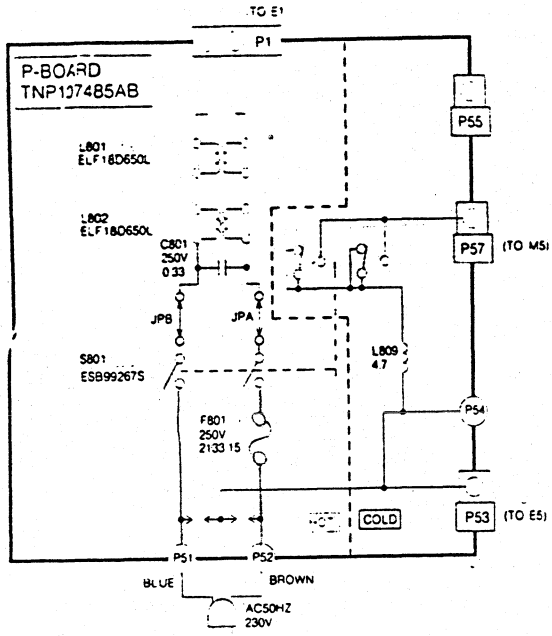
Panasonic

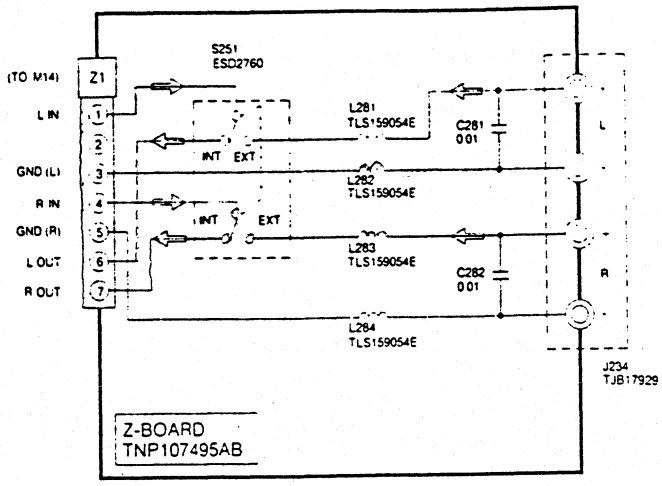
WAVEFORM PATTERN TABLE
SIGNAL TABELLE

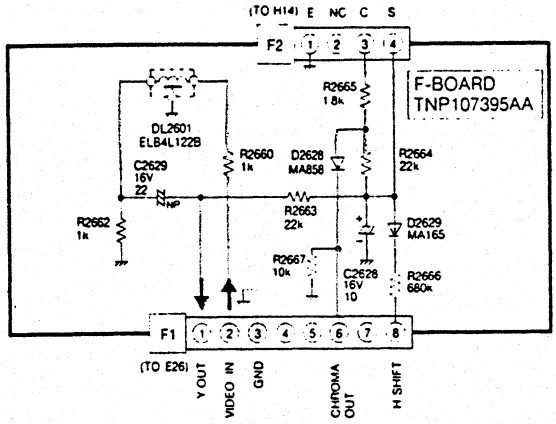
Pin 3 IC101 2.6Vp-p (20uS)	Pin 8 IC3502 2.5Vp-p (20uS)	Pin 17 IC2401 2.5Vp-p (20uS)
Pin 15 IC602 0.5Vp-p (20uS)	Pin 12 IC601 1.6Vp-p (20uS)	PIN 11 IC601  0.5Vp-p (20uS)
Pin 10 IC601  0.3Vp-p (20uS)	Pin 11 IC501 1.6Vp-p (20uS)	Pin 15 IC501  3Vp-p (20uS)
PIN 6 IC451 2.8Vp-p (5mS)	TPE42 45Vp-p (5mS)	Pin 1 IC501  4.0Vp-p (5mS)
Pin 4 IC451  3.8Vp-p (5mS)	Pin 10 T551  22Vp-p (20uS)	Pin 4 T551 75Vp-p (20uS)
COLLECTOR Q551  1500Vp-p (20uS)	BASE Q551 15Vp-p (20uS)	TPE69 0.2Vp-p (20uS)
TPE17  3.2Vp-p (20uS)	TPE16  3.2Vp-p (20uS)	TPE15 3.2Vp-p (20uS)
TPY1  115Vp-p (20uS)	TPY2  120Vp-p (20uS)	TPY3 120Vp-p (20uS)

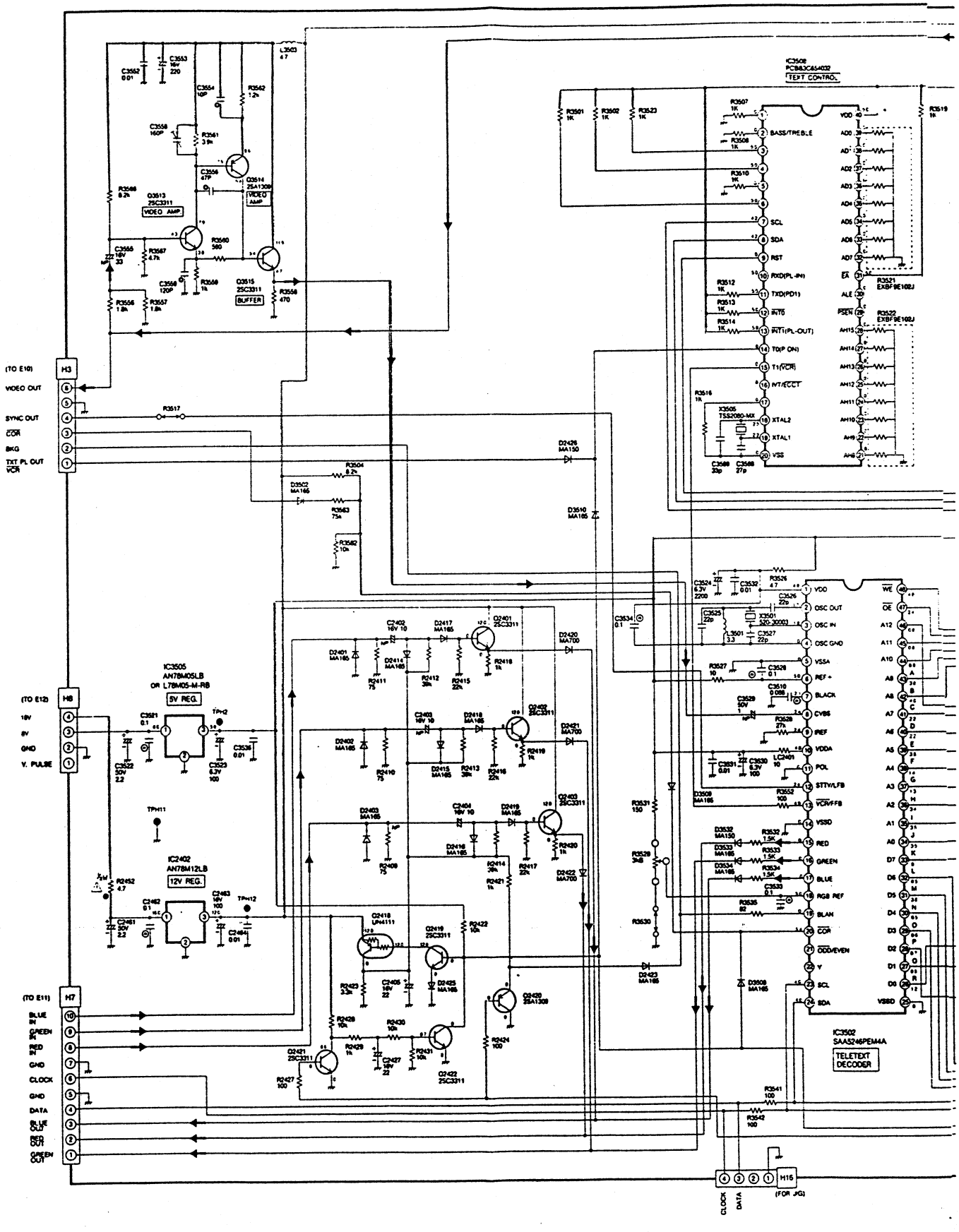

IC2351
STK4392TV
AUDIO AMP.
PRE AMP
PRE DRIVER
BIAS
POWER AMP
BOOT-STRAPPING
K-BOARD
TNP107172AW
K1
K2
K3
(TO E8)
(TO L1)
R IN
L IN
R OUT
L OUT

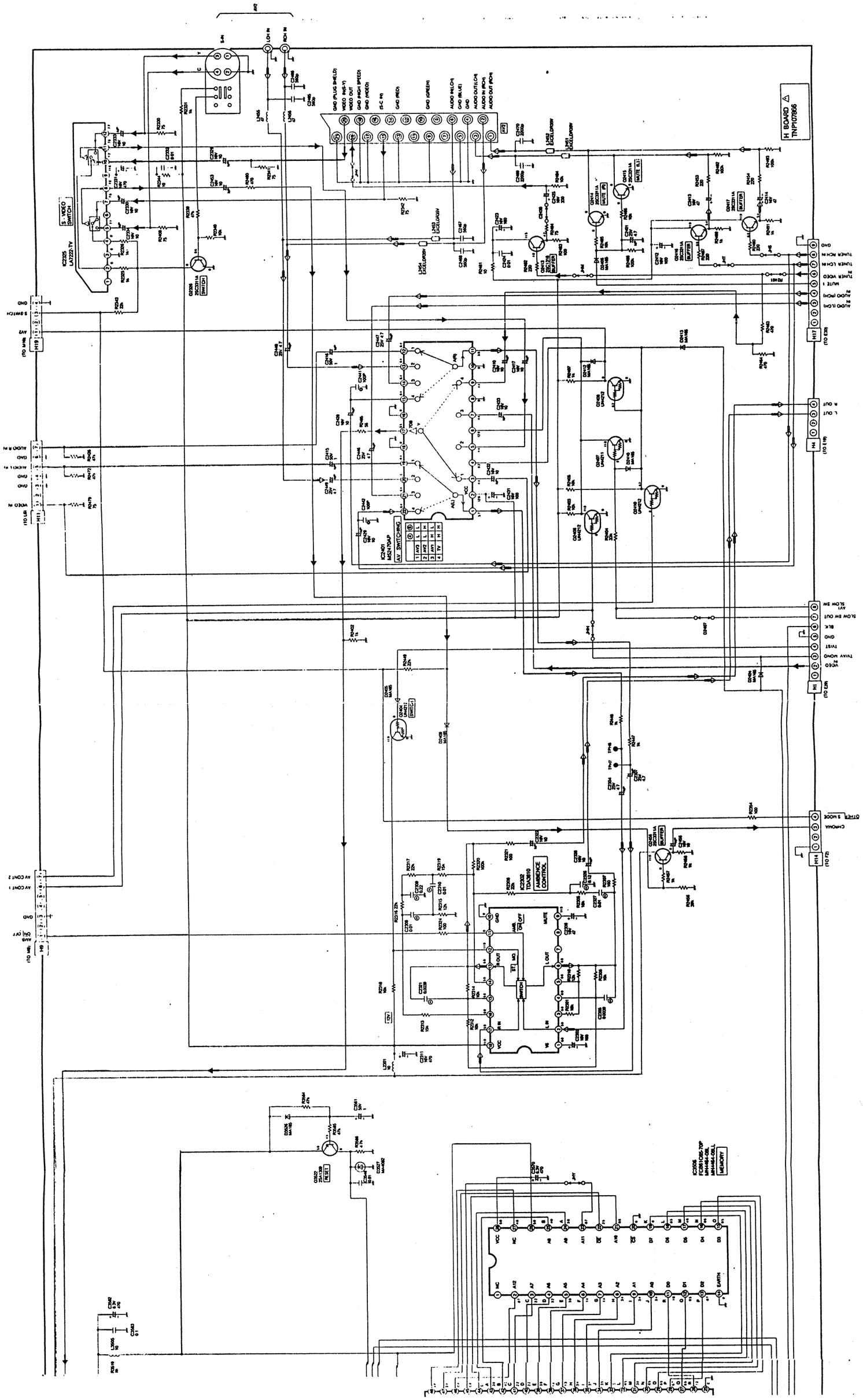

R OUT
EARTH (R)
L OUT
EARTH (L)
EARTH (V)
VIDEO OUT
(TO H11)
L6
VIDEO IN
L CH IN
R CH IN
AV3
(TO K2)
L1
L IN
EARTH (L)
R IN
EARTH (R)
JLD
(TO Z1)
L4
L2
L3
JLL
JLN
LEFT
RIGHT
L-BOARD
TNP107488AH

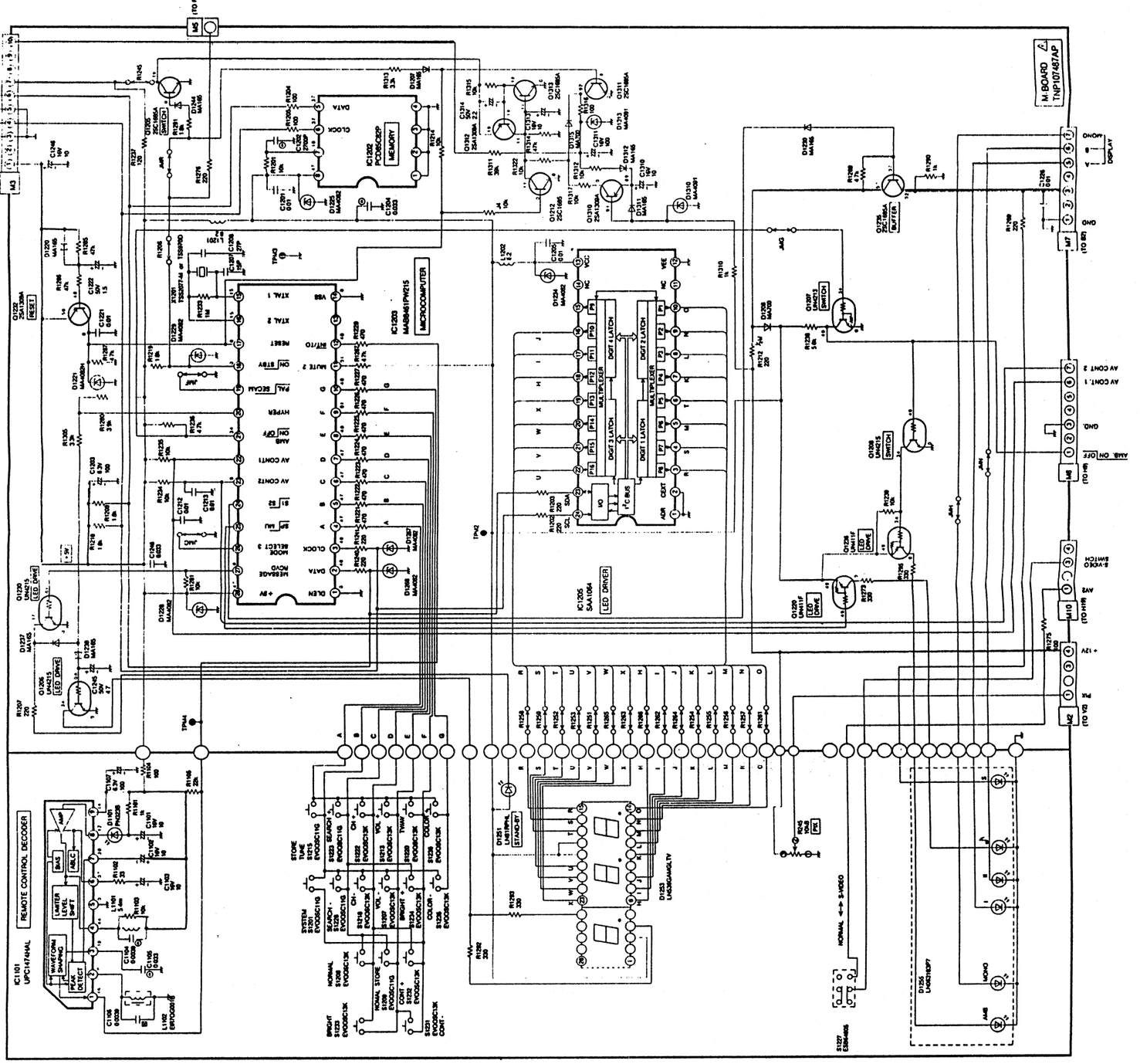

TO E1
P1
P-BOARD
TNP107485AB
P55
L801
ELF18D650L
L802
ELF18D650L
C801
250V
0.33
P57
(TO M5)
JPB
JPA
S801
ESB99267S
L809
4.7
P54
F801
250V
2133.15
COLD
P53
(TO E5)
P51
P52
BLUE
BROWN
AC50HZ
230V

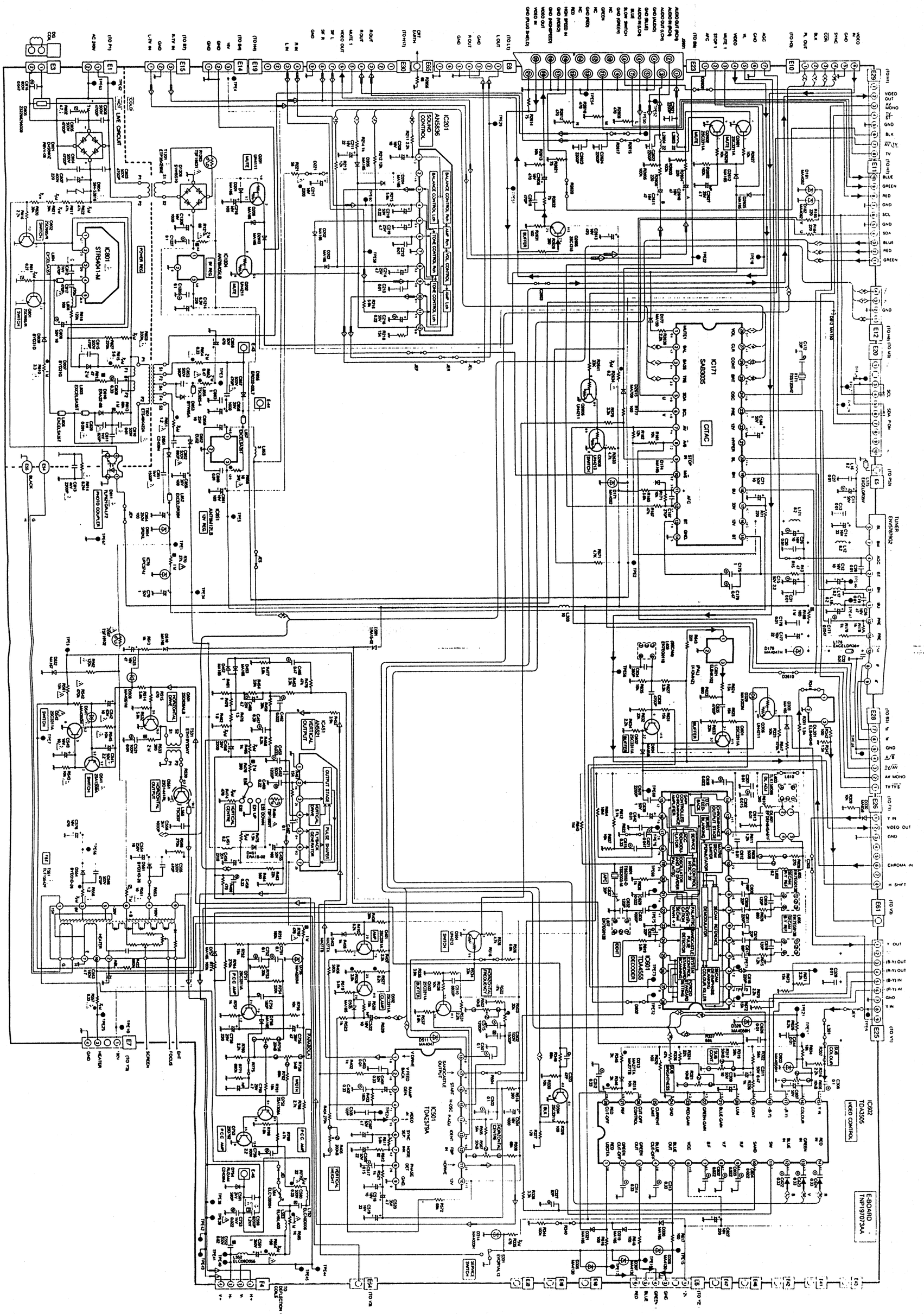

S251
ESD2760
(TO M14)
Z1
L IN
GND (L)
R IN
GND (R)
L OUT
R OUT
INT
EXT
INT
EXT
L281
TLS159054E
C281
0.01
L282
TLS159054E
L283
TLS159054E
C282
0.01
L284
TLS159054E
L
R
J234
TJB17929
Z-BOARD
TNP107495AB

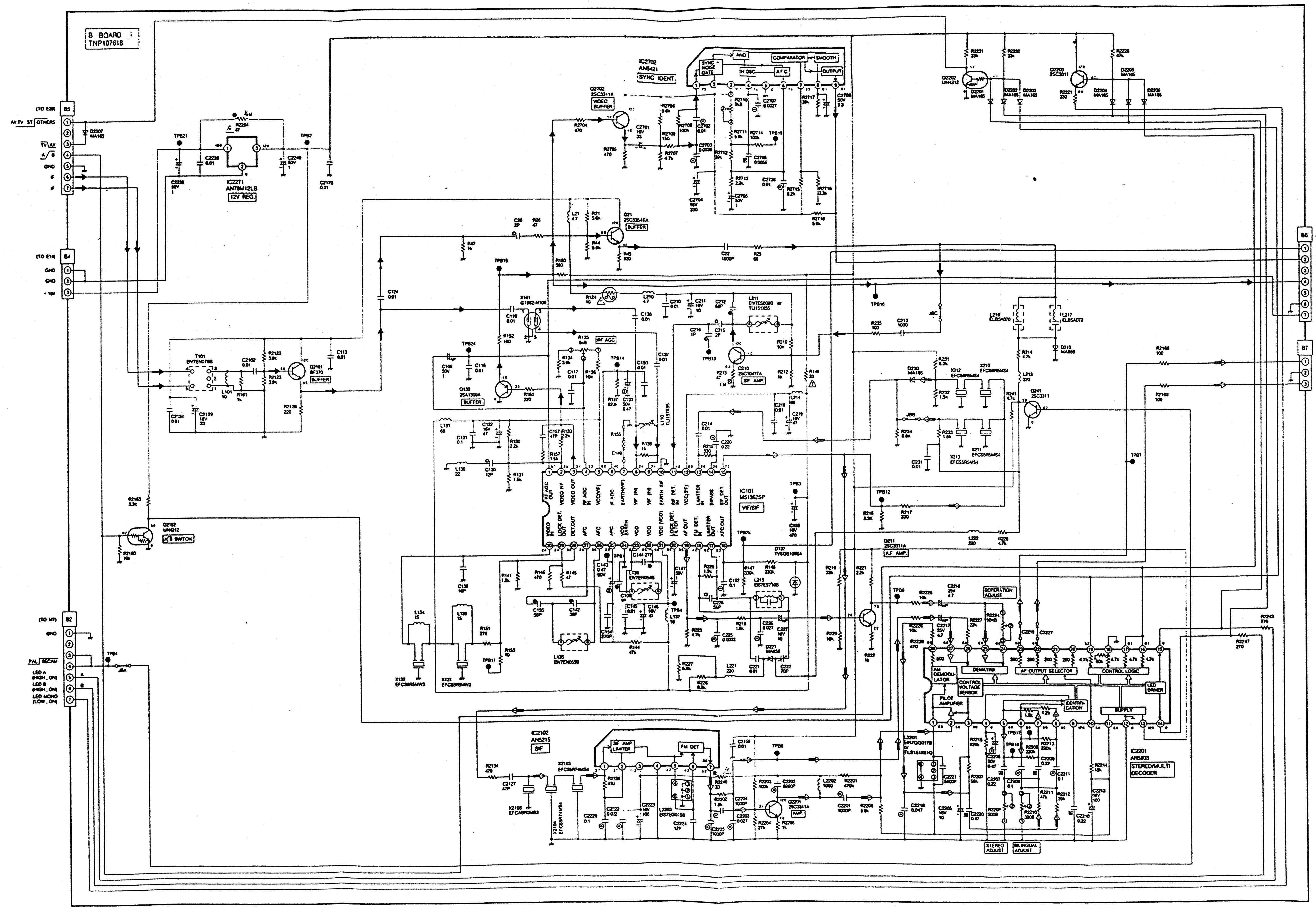

(TO H14)
E
NC
C
S
F2
F-BOARD
TNP107395AA
R2665
1.8k
DL2601
ELB4L122B
R2660
1k
D2628
MA858
R2664
22k
C2629
16V
22
NP
R2663
22k
R2662
1k
D2629
MA165
R2667
10k
C2628
16V
10
R2666
680k
F1
(TO E26)
Y OUT
VIDEO IN
GND
CHROMA OUT
H SHIFT

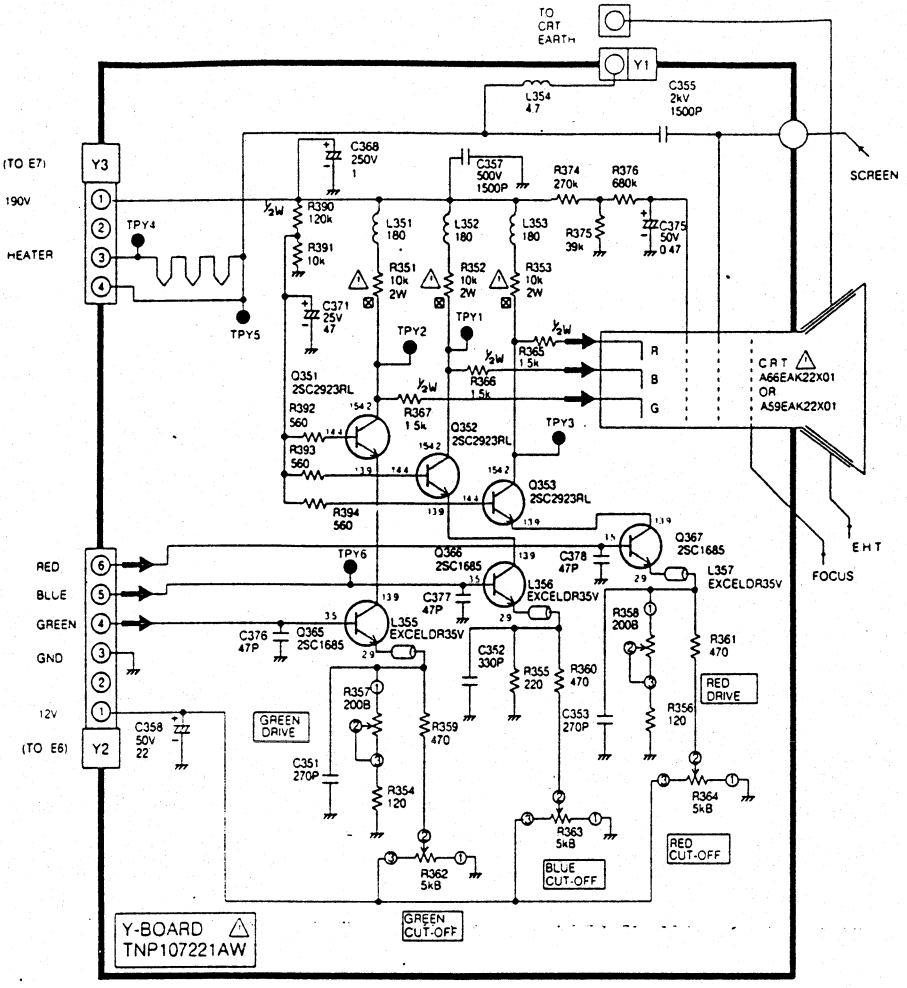

IC3508
PCB83C654032
TEXT CONTROL
BASS/TREBLE
SCL
SDA
RST
RXD(PL-IN)
TXD(PD1)
INT0
INT1(PL-OUT)
T0(P ON)
T1(VCR)
INT/ECCT
XTAL2
XTAL1
VSS
VDD
EA
ALE
PSEN
X3505
TSS2080-MX
R3521
EXBF8E102J
R3522
EXBF8E102J
VIDEO AMP
VIDEO AMP
BUFFER
(TO E10)
VIDEO OUT
SYNC OUT
COR
BKG
TXT PL OUT
VCR
H3
IC3505
AN78M05LB
OR L78M05-M-RB
5V REG.
(TO E12)
18V
8V
GND
V. PULSE
H8
IC2402
AN78M12LB
12V REG.
(TO E11)
BLUE IN
GREEN IN
RED IN
GND
CLOCK
GND
DATA
BLUE OUT
RED OUT
GREEN OUT
H7
IC3502
SAA5246PEM4A
TELETEXT DECODER
VDD
OSC OUT
OSC IN
OSC GND
VSSA
REF +
BLACK
CVBS
IREF
VDDA
POL
STTV/LFB
VCR/FFB
VSSD
RED
GREEN
BLUE
RGB REF
BLAN
COR
ODD/EVEN
V
SCL
SDA
VSSD
H15
(FOR JIG)
CLOCK
DATA

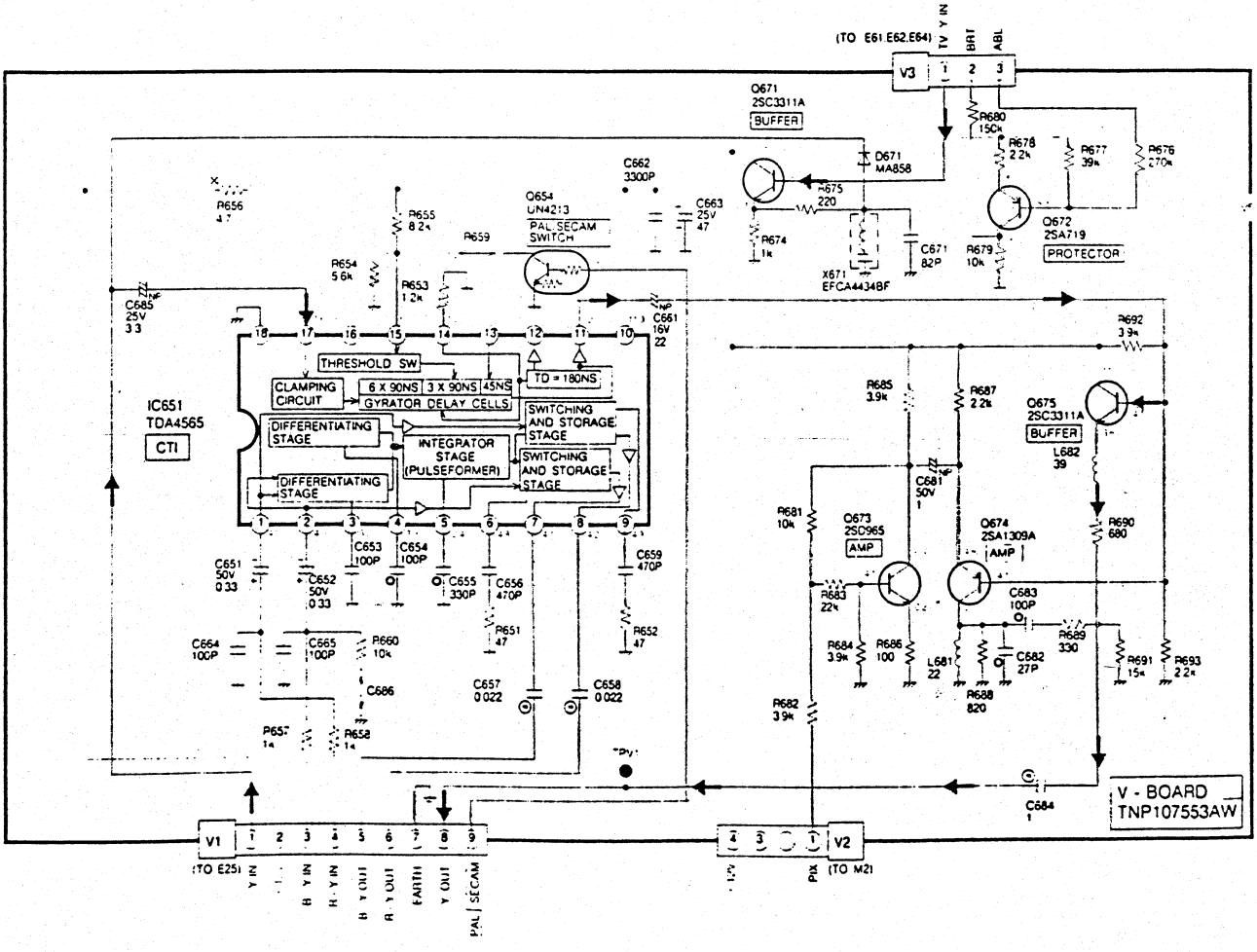

H BOARD
TNP1070B6
S-VIDEO SWITCH
AV SWITCHING
AMBIENCE CONTROL
RESET
MEMORY
TUNER MCH IN
TUNER LCH IN
TUNER VIDEO
AUDIO MCH IN
AUDIO LCH IN
R OUT
L OUT
SLOW SW OUT
BLK
TV/ST
TV/AV MONO
CHROMA
VIDEO IN
AV CONT 1
AV CONT 2
S SWITCH


M.BOARD
TNP1074AP
MICROCOMPUTER
MAB8461PW215
IC1203
MEMORY
PCD8582P
IC1202
LED DRIVER
SAA1064
IC1205
REMOTE CONTROL DECODER
UPC1474HAL
IC1101
MULTIPLEXER
DIGIT 1 LATCH
DIGIT 2 LATCH
DIGIT 3 LATCH
DIGIT 4 LATCH
I²C BUS
RESET
BUFFER
DISPLAY
STAND-BY
NORMAL ↔ S-VIDEO
STORE
TUNE
SYSTEM
SEARCH
NORMAL
BRIGHT
CONT.
COLOR
VOL.
CH.
THRU
LED DRIVE
SWITCH

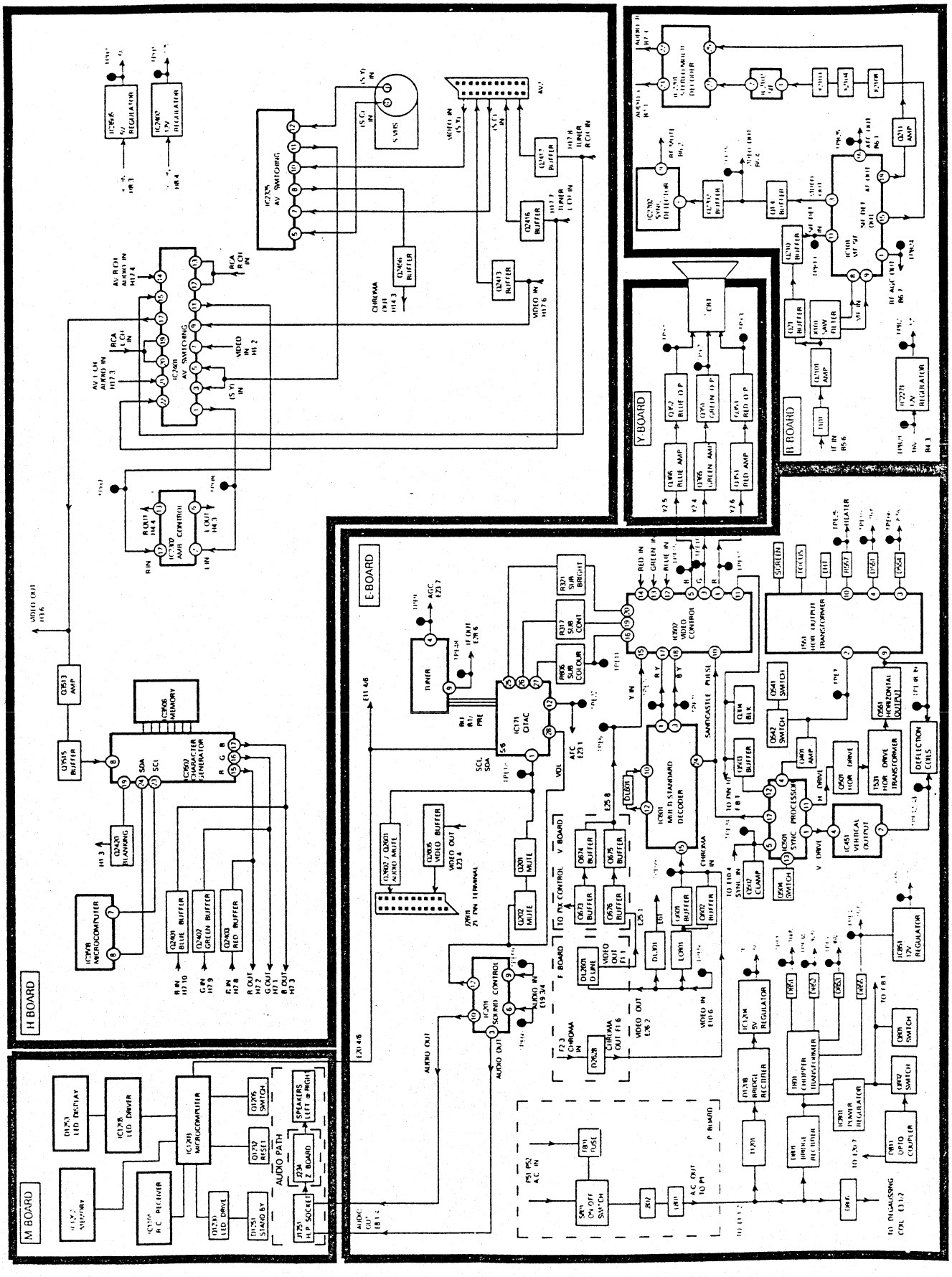

IC201
AN5635
SOUND CONTROL
IC501
TDA2579A
IC601
TDA3505
VIDEO CONTROL
IC171
SAB9035
CITAC
IC801
STR54041-M
POWER REG.
IC851
AN5521
VERTICAL OUTPUT
E-BOARD
TNF19707JAA
TUNER
ENV57B78Q2


B BOARD
TNP107618
IC2702
AN5421
SYNC IDENT
IC2271
AN78M12LB
12V REG.
IC101
M51362SP
VIF/SIF
IC2102
AN5215
SIF
IC2201
AN5803
STEREO/MULTI DECODER
(TO E28) B5
(TO E14) B4
(TO M7) B2
(TO E22) B6
(TO E15) B7
AFC
VIDEO OUT
AGC
AUDIO-L (I)
AUDIO-R (II)
GND
+16V
PAL SECAM
LED A (HIGH ; ON)
LED B (HIGH ; ON)
LED MONO (LOW ; ON)
STEREO ADJUST
BILINGUAL ADJUST
SEPERATION ADJUST
A/B SWITCH
RF AGC
SIF AMP.
A.F AMP.
VIDEO BUFFER
BUFFER
AMP


TO CRT EARTH
Y1
L354 4.7
C355 2kV 1500P
SCREEN
(TO E7)
Y3
190V
HEATER
C368 250V 1
C357 500V 1500P
R374 270k
R376 680k
R390 120k
R391 10k
L351 180
L352 180
L353 180
R375 39k
C375 50V 0.47
R351 10k 2W
R352 10k 2W
R353 10k 2W
TPY4
TPY5
C371 25V 47
TPY2
TPY1
R365 1.5k
R366 1.5k
R367 1.5k
R
B
G
CRT
A66EAK22X01
OR
A59EAK22X01
Q351 2SC2923RL
R392 560
R393 560
R394 560
Q352 2SC2923RL
Q353 2SC2923RL
TPY3
EHT
FOCUS
RED
BLUE
GREEN
GND
12V
(TO E6)
Y2
TPY6
Q366 2SC1685
C378 47P
Q367 2SC1685
L357 EXCELDR35V
L356 EXCELDR35V
C377 47P
C376 47P
Q365 2SC1685
L355 EXCELDR35V
C352 330P
R355 220
R360 470
R358 200B
R361 470
R357 200B
R359 470
C353 270P
R356 120
RED DRIVE
GREEN DRIVE
C358 50V 22
C351 270P
R354 120
R364 5kB
R363 5kB
R362 5kB
RED CUT-OFF
BLUE CUT-OFF
GREEN CUT-OFF
Y-BOARD
TNP107221AW


(TO E61,E62,E64)
V3
Y IN
BRT
ABL
Q671 2SC3311A BUFFER
R680 150k
D671 MA858
R678 2.2k
R677 39k
R676 270k
R675 220
R674 1k
X671 EFCA4434BF
C671 82P
R679 10k
Q672 2SA719 PROTECTOR
C662 3300P
Q654 UN4213 PAL SECAM SWITCH
R656 47
R665 8.2k
R659
C663 25V 47
R654 5.6k
R653 1.2k
C685 25V 3.3
C661 16V 22
IC651 TDA4565 CTI
THRESHOLD SW
CLAMPING CIRCUIT
6 X 90NS
3 X 90NS
45NS
TD = 180NS
GYRATOR DELAY CELLS
DIFFERENTIATING STAGE
INTEGRATOR STAGE (PULSEFORMER)
SWITCHING AND STORAGE STAGE
DIFFERENTIATING STAGE
SWITCHING AND STORAGE STAGE
C651 50V 0.33
C652 50V 0.33
C653 100P
C654 100P
C655 330P
C656 470P
C659 470P
C664 100P
C665 100P
R660 10k
C686
R657 1k
R658 1k
R651 47
R652 47
C657 0.022
C658 0.022
R692 3.9k
R685 3.9k
R687 2.2k
Q675 2SC3311A BUFFER
L682 39
C681 50V 1
R681 10k
Q673 2SC965 AMP
Q674 2SA1309A AMP
R690 680
R683 22k
C683 100P
R684 3.9k
R686 100
L681 22
C682 27P
R689 330
R691 15k
R693 2.2k
R688 820
R682 3.9k
C684 1
V - BOARD
TNP107553AW
V1
(TO E25)
Y IN
B Y IN
R Y IN
B Y OUT
R Y OUT
EARTH
Y OUT
PAL SECAM
V2
12V
PIX
(TO M21)

BLOCK DIAGRAM
SCHALTBILD BLOCK



SCHEMATIC DIAGRAM FOR MODEL TX-28J1C
(Alpha-2 Chassis)

ZEICHENERKLÄRUNG FÜR MODELL TX-28J1C
(Alpha-2 Chassis)

Important Safety Notice

Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.

Wichtiger Sicherheitsinweis

Teile,die mit einen Hinweis ⚠ gekennzeichnet sind, sind wichtig für die Sicherheit. Sollte ein Auswechseln erforderlich sein, sind unbedingt Originalteile einzusetzen.

NOTES:

1. RESISTOR
   All resistors are carbon 1/4W, unless marked as follows:
   Unit of resistance is the OHM (K =1,000, M = 1,000,000).

   ○ : Nonflammable ⊠ Metal Oxide
   △ : Solid ◎ : Metal Film
   ⊠ : Wire Wound ⊗ : Fuse
2. CAPACITORS
   All capacitors are ceramic 50V, unless marked as follows:
   Unit of capacitance is uF, unless otherwise stated.

   ⊗ : Temperature Compensation
   Ⓜ : Polyester
   ⓜ : Metalized Polyester
   ⊠ : Polypropylene
   + − : Electrolytic
   NP : Bipolar
   Ⓣ : Dipped Tantalum
   Ⓩ : Z-Type
3. COIL
   Unit of inductance is uH, unless otherwise stated.
4. Components marked ' L' on the schematic diagram shows lead - less parts.
5. TEST POINT
   ● : Test Point position.
6. EARTH SYMBOL
   ⏚ : Chassis Earth (Cold) ⊥ : Line Earth (Hot)
7. VOLTAGE MEASUREMENT
   Voltage is measured by a DC voltmeter.
   Conditions of the measurement are the following:
   Power Source ..... 230V AC, 50Hz
   Receiving signal ..... Colour Bar signal (RF)
   All the other customer's controls..... Maximum
8. This schematic diagram is the latest at the time of printing and subject to change without notice.

REMARKS:

1. The Power Circuit contains a circuit area which uses a separate power supply to isolate the earth connection. The circuit is defined by HOT and COLD indications in the schematic diagram. Take the following precautions. All circuits,except the Power Circuit, are cold.

PRECAUTIONS

a. Do not touch the hot part or the hot and cold parts at the same time as you are liable to a shock hazard.
b. Do not short-circuit the hot and cold circuits as electrical components may be damaged.
c. Do not connect an instrument, such as an oscilliscope, to the hot and cold circuits simultaneously, as this may cause fuse failure. Connect the earth of instruments to the earth connection of the circuit being measured.
d. Make sure to disconnect the power plug before removing the chassis.

2. The following resistors are fusable safety components,they are rated at the following value.

Ref:	Part No:	Value:
R484	TSF19801	800mA
R567	TSF19102	1A
R1283	TSF19631	630mA

ANMERKUNG

1. WIDERSTÄNDE
   Alle 1/4 Watt Widerstände sind Kohlewiderstände, Abweichungen sind wie folgt gekennzeichnet:
   Die Maßeinheit ist OHM (Ω) (K =1,000 M =1,000,000).

   ○ : nicht brennbar . ⊠ : Metal Oxyd
   △ : Lastwiderstand ◎ : Metall Film
   ⊠ : Draht ⊗ : Sicherung
2. KONDENSATOREN
   Alle Kondensatoren sind Keramikausfürungen.
   Spannungsfestigkeit 50 V, Abweichungen sind wie folgt gekennzeichnet.
   Die Maßeinheit ist uF, wenne keine anderen Bezeichnungen gennant sind.

   ⊗ : Temperatur Kompensation
   Ⓜ : Polyester
   ⓜ : Metallisches Polyester
   ⊠ : Polypropylen
   + − : Elektrolyt
   NP : Bipolar
   Ⓣ : Tantal
   Ⓩ : Z-Typ
3. SPULEN
   Die Maßeinheit ist uH, Abweichungen sind gekennzeichnet.
4. Mit 'L' gekennzeichnete Teile sind ohne Anschlußdrähte.
5. TESTPUNKTE
   ● : Kennzeichnung der Testpunktposition.
6. MASSESYMBOL
   ⏚ : Erdung am Chassis (kalt) ⊥ : Erdung an Masse-Leitung
7. SPANNUNGSMESSUNG
   Spannungsmessungen sind mit einem DC-Voltmeter durchzuführen.
   Die Meßbedingungen sind folgende:
   Netzspannung ..... 230 V / 50 Hz
   Wiedergabe Signal ..... Farbbalken - Testbild
   Alle übrigen Einstellungen für Benutzer ..... Sollangaben
8. Änderungen im Laufe der Fertigung sind möglich.

BEMERKUNGEN:

Das Schaltnetzteil enthält Bereiche, die direkt mit dem Netz verbunden sind. Diese Bereiche sind im Schalplan mit "HOT" gekennzeichnet. Alle anderen Schaltungen sind mit "COLD" gekennzeichnet und Haben keine direkte Verbindung mit dem Netz.

Für den netzverbundenen Bereich ("HOT") sind folgende Vorsichtsmassregeln zu beachten :

a. Weder die Leitungen im heißen noch Leitungen im heißen und im kalten Bereich gleichzeitig berühren. Es besteht die Gefahr eines elektrischen Schlages.
b. Keinesfalls die Leitungen im heißen Bereich mit denen im kalten Bereich verbinden oder kurzschliessen. Dies kann zur Zerstörung von Bauteilen oder Sicherungen führen. Außerdem ist die elektrische Betriebssicherheit des Gerätes nicht mehr gegeben.
c. Kein Messinstrumente gleichzeitig an Leitungen im heissen und kalten Bereich anschliessen. Sicherungen könnten zerstört werden. Die Erde des Messinstrumentes immer mit der des zu prüfenden Schaltkreises verbinden.
d. Vor Ausbau des Chassis, Stecker aus der Netzsteckdose ziehen.

2. Die nachfolgenden Widerstände sind Sicherungswiderstände. Im Falle eines Defektes dürfen nur Originalersatzteile verwendet werden.

Pos.Nr:	Ersatzteil-NR:	Wert:
R484	TSF19801	800mA
R567	TSF19102	1A
R1283	TSF19631	630mA